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Selected Health Practices Among Ohio's Rural Residents

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G. HOWARD PHILLIPS and ALBERT PUGH[1]

INTRODUCTION

The health of rural people is becoming of increasing concern in American society. This is evidenced in a number of recent publications. For example, in a report by the President's National Advisory Commission on Rural Poverty, a number of rural health problems are emphasized (7). The report states:

"Regardless of income, rural residents, especially the elderly, are much more likely to have disabling chronic health conditions than their urban counterparts.

"Regardless of income, rural farm residents average fewer physician visits per person—consultation with a physician or services provided by a nurse or other person under the physician's supervision—than rural nonfarm and urban residents."

Most medical personnel suggest that the health of rural people can be greatly improved by preventive health measures (10). This study was concerned with this issue. What is the level of participation in selective preventive health activities by Ohio's rural residents? Are there differences among rural residents in their level of participation when such variables as age, education, place of residence, sex, and family size are considered? To answer these questions, three objectives were developed. They were:

- To measure the level of participation in selected health practices by Ohio's rural residents
- To compare the level of participation in selected health practices of farm and rural nonfarm residents
- To examine the levels of participation in selected health practices by age, sex, educational attainment, and family size.

PROCEDURE

A stratified random sample of 12 of Ohio's 88 counties was selected. Two counties were randomly selected from each of six geographic areas representing various topographic areas, climatic conditions, and types of farming. The sample counties are shown in Figure 1.

Cluster samples of 10 or fewer farm and rural nonfarm families living outside of incorporated places were randomly selected in each of the 12 counties. A farm family was defined as a family living on a farm with 10 acres or more and selling $50 or more of farm products annually or with less than 10 acres and selling $250 or more of farm products annually. A rural nonfarm family was defined as a family living in a rural area outside of an incorporated place but not qualifying as a farm family.

A questionnaire was developed to standardize responses. Volunteer interviewers were solicited in each county with the assistance of the Cooperative Extension Service. These interviewers participated in a 3-hour county training meeting where they were assigned the families they were to contact. The selected families were interviewed during the first 2 weeks of April 1967.

During the interview period, 7,260 farm people and 6,215 rural nonfarm people living outside incorporated places were contacted. The farm sample represented 14.7 percent of the farm population in the 12 sample counties and 1.9 percent of the total farm population of the state. The rural nonfarm population living outside of incorporated places represented 2.8 percent of the rural nonfarm population in the 12 sample counties and 0.23 percent of the total rural nonfarm population of the state.

The total farm population in the 12 sample counties represents 12.6 percent of Ohio's 390,423 farm population. The total rural nonfarm population in the 12 sample counties represents 8.3 percent of Ohio's 2,701,970 rural nonfarm population.

To test the adequacy of the size of sample for the two groups, an 80 percent random sample of the total sample was taken. Selected items were statistically tested to see if there was a significant difference between the 80 percent sample group and the total sample. No significant differences were found. It was concluded that the sample was of sufficient size to adequately represent the population.

It should be noted that the data presented in the tables at times have a different number (N). A few questions were occasionally omitted because of inadequate information. Due to the large size of the sample, it was felt that these deletions would not grossly affect the distribution since there was no observable pattern to the rejected questions.

The chi-square test of difference was the exclusive statistical test utilized in the study.

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TABLE 1.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Physical Checkups in the Past 2 Years, 1967.

	Farm		Rural Nonfarm		Total Rural	
	Number	Percent	Number	Percent	Number	Percent
Physical Checkup	2,563	35.3	2,556	41.2	5,119	38.0
No Physical Checkup	4,700	64.7	3,649	58.8	8,349	62.0
Total	7,263	100.0	6,205	100.0	13,468	100.0

$X^2 = 49.505$, d.f. $= 1$, $P < 0.01$

FIG. 1.—Geographical Distribution of Sample Counties.

FINDINGS

Physical Checkups

As medical technology and concern about human health increase, there is an increasing consciousness of physical well-being among most people. Medical personnel for some time have recommended an annual physical examination for most people. Many groups have adopted physical checkups as a regular part of their health program. These include schools, factories, and other types of organizations.

Table 1 reveals that 38 percent of Ohio's rural residents had a complete physical checkup during the past 2 years. When farm and rural nonfarm were compared, it was found that rural nonfarm people had a significantly higher number of physical checkups than farm residents. This finding was in the direction expected. It was hypothesized that occupational requirements and a higher concern for health matters among the rural nonfarm residents tend to partially account for this differential. However, it was beyond the scope of this study to measure the causal factors.

In a 1962 study of Health Practices Among Ohio Farm Residents, it was found that 35 percent of the population had physical checkups within the past 2 years (1). Table 1 of the 1967 study shows that only 35.3 percent of farm residents had physical checkups in the past 2 years. Thus, apparently no progress was made in the percentage of farm people securing physical checkups between the 1962 and 1967 studies.

Table 2 shows the number and percent of Ohio's farm and rural nonfarm people who had a physical checkup in the past 2 years by age groups. Children 14 years and under had the lowest number of physical checkups in the past 2 years. The 15 to 64 and 65 and over age groups were not significantly different in the percent of physical checkups. When the 14 and under age group was compared with the adult group of 15 years and above, the adult group had a statistically significant higher number of physical checkups in the past 2 years.

These findings were not unexpected. Adults have many more reasons for physical checkups than children. Such things as pregnancies, injuries, insurance examinations, company regulations requiring employees to be examined, and military examinations are among many reasons that prompt adults to secure physical checkups. It is obvious from this data that families do not, as a general rule, schedule regular physical examinations for children.

Differences in the percent of males (37.9) and females (38.1) who had physical checkups in the past 2 years were not significant. This was not as expected since it was anticipated that females would be more apt to be concerned with their general health. However, it is understandable since many organizations require physical checkups for males, such as industries, the military, and insurance groups.

TABLE 2.—Number and Percent of Ohio Rural Residents Who Had Physical Checkups in the Past 2 Years by Age Groups, 1967.

	Age							
	0-14		15-64		65 and Over		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Physical Checkup	1,157	26.2	3,519	43.8	443	43.3	5,119	38.0
No Physical Checkup	3,260	73.8	4,509	56.2	580	56.7	8,349	62.0
Total	4,417	100.0	8,028	100.0	1,023	100.0	13,468	100.0

$X^2 = 389.459$, d.f. $= 2$, $P < 0.01$

TABLE 3.—Number and Percent of Ohio Rural Residents Who Had Physical Checkups in the Past 2 Years by Educational Attainments of the Heads of Households, 1967.

	0-11 Years		12 Years		More Than 12 Years		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Physical Checkup	1,842	34.3	2,540	38.4	702	50.9	5,084	38.0
No Physical Checkup	3,553	65.7	4,071	61.6	678	49.1	8,282	62.0
Total	5,375	100.0	6,611	100.0	1,380	100.0	13,366	100.0

$X^2 = 45.225$, d.f. $= 2$, $P < 0.01$

TABLE 4.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Physical Checkups in the Past 2 Years by Educational Attainments of Heads of Households, 1967.

	Educational Attainment											
	0-11 Years				12 Years				More Than 12 Years			
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm		(5) Farm		(6) Rural Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Physical Checkup	874	31.5	968	37 3	1,364	35.6	1,176	42.3	309	51.4	393	50.4
No Physical Checkup	1,905	68.5	1,628	62.7	2,465	64.4	1,606	57.7	292	48 6	386	49.6
Total	2,779	100.0	2,596	100.0	3,829	100.0	2,782	100.0	601	100.0	779	100.0

X^2 for columns 1, 3, and 5 = 86.503, d.f. = 2, $P < 0.01$
X^2 for columns 2, 4, and 6 = 45.225, d.f. = 2, $P < 0.01$

The number of physical checkups in the past 2 years was significantly different for rural Ohio heads of households by educational attainment. In Table 3, it may be noted that only 34.3 percent of those persons in households where the head had 11 years or less of education had physical checkups compared to 38.4 percent for those with 12 years of education and 50.9 percent for those with more than 12 years. These differences were statistically significant.

Table 4 shows a breakdown by farm and rural nonfarm people with physical checkups by educational attainments. In both cases, the higher the educational attainments of the heads of households, the greater the percent having physical checkups.

The number and percent of persons with physical checkups in the past 2 years by family size is shown in Table 5. There was a significant difference between smaller and larger families as to the number who had physical checkups. The members of smaller families (four or less members) tended to have more checkups than members of larger families (five or more members). It is presumed that the cost factor may be one of the logical explanations of this finding. Table 6 shows the data by farm and rural nonfarm. In essence, the general directions are the same, with only a small percentage variation.

Dental Care

Preventive dental care programs through schools and tooth paste advertisements have created an awareness of proper dental care among most people. Fluoridation programs have been a controversial issue throughout Ohio. These kinds of activities have brought about more concern for dental health than perhaps any other health practice.

This study shows that of all the health practices studied, dental checkups exceeded all others in participation by rural people. Table 7 shows that 54.8 percent of Ohio's rural residents had a dental checkup within the past 2 years. There was no significant difference between farm and rural nonfarm people who had been to a dentist. In the 1962 study, 52 percent of the farm people had a dental checkup in the past 2 years (1). This indicates that more farm people in 1967 (55.5 percent) were participating in this health practice.

Table 8 compares the participation patterns of males and females. Females exceeded the males in their participation in this health practice at a significant level. Although there was a statistically significant difference, the magnitude of the difference was not great.

It was hypothesized that the educational attainment of heads of households would reflect participation in dental checkups by rural residents.

TABLE 5.—Number and Percent of Ohio Rural People Who Had Physical Checkups in the Past 2 Years by Family Size, 1967.

	Family Size					
	Four or Less Members		Five or More Members		Total	
	Number	Percent	Number	Percent	Number	Percent
Physical Checkup	2,764	43.1	2,355	33.4	5,119	38.0
No Physical Checkup	3,652	56 9	4,697	66.6	8,349	62.0
Total	6,416	100.0	7,052	100.0	13,468	100.0

$X^2 = 133.740$, d.f. $= 1$, $P < 0.01$

TABLE 6.—Number and Percent of Ohio Farm and Rural Nonfarm People Who Had Physical Checkups in the Past 2 Years by Family Size, 1967.

	Family Size							
	Four or Less Members				Five or More Members			
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Physical Checkup	1,400	39.2	1,364	47.9	1,163	31.5	1,192	35.5
No Physical Checkup	2,168	60.8	1,484	52.1	2,532	68.5	2,165	64.5
Total	3,568	100 0	2,848	100.0	3,695	100.0	3,357	100.0

X^2 for columns 1 and 3 $= 47.900$, d.f. $= 1$, $P < 0.01$
X^2 for columns 2 and 4 $= 97.570$, d.f. $= 1$, $P < 0.01$

TABLE 7.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Dental Checkups in the Past 2 Years, 1967.

	Farm		Rural Nonfarm		Total Rural	
	Number	Percent	Number	Percent	Number	Percent
Dental Checkup	4,029	55.5	3,355	54.1	7,384	54 8
No Dental Checkup	3,234	44.5	2,850	45.9	6,084	45.2
Total	7,263	100.0	6,205	100.0	13,468	100.0

$X^2 = 2.662$, d.f. $= 1$, $P > 0.05$

TABLE 8.—Number and Percent of Ohio Rural Males and Females Who Had Dental Checkups in the Past 2 Years, 1967.

	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Dental Checkup	3,636	52.5	3,748	57.3	7,384	54.8
No Dental Checkup	3,286	47.5	2,798	42.7	6,084	45.2
Total	6,922	100.0	6,546	100.0	13,468	100.0

$X^2 = 30.341$, d.f. $= 1$, $P < 0.01$

TABLE 9.—Number and Percent of Ohio Rural Residents Who Had Dental Checkups in the Past 2 Years by Educational Attainments of the Heads of Households, 1967.

	Educational Attainment							
	0-11 Years		12 Years		More Than 12 Years		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Dental Checkup	2,272	41.5	4,047	63.0	1,023	69.9	7,342	55.0
No Dental Checkup	3,197	58.5	2,376	37.0	441	30.1	6,014	45.0
Total	5,469	100.0	6,423	100.0	1,464	100.0	13,356	100.0

$X^2 = 697.394$, d.f. $= 2$, $P < 0.01$

TABLE 11.—Number and Percent of Ohio Rural Residents Who Had Dental Checkups in the Past 2 Years by Family Size, 1967.

	Family Size					
	Four or Less Members		Five or More Members		Total	
	Number	Percent	Number	Percent	Number	Percent
Dental Checkup	3,292	51.3	4,092	58.0	7,384	54.8
No Dental Checkup	3,125	48.7	2,960	42.0	6,085	45.2
Total	6,417	100.0	7,052	100.0	13,468	100.0

$X^2 = 61.342$, d.f. $= 1$, $P < 0.01$

TABLE 12.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Dental Checkups in the Past 2 Years by Family Size, 1967.

	Family Size							
	Four or Less Members				Five or More Members			
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Dental Checkup	1,798	50.4	1,494	52 5	2,231	60.4	1,861	55.4
No Dental Checkup	1,770	49.6	1,355	47.5	1,464	39.6	1,496	44.6
Total	3,568	100.0	2,849	100.0	3,695	100.0	3,357	100.0

X^2 for columns 1 and 3 $= 73.290$, d.f. $= 1$, $P < 0.01$
X^2 for columns 2 and 4 $= 5.658$, d.f. $= 1$, $P < 0.02$
X^2 for columns 1 and 2 $= 2.587$, d.f. $= 1$, $P > 0.05$
X^2 for columns 3 and 4 $= 17.355$, d.f. $= 1$, $P < 0.01$

TABLE 13.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Chest X-rays or Tuberculin (TB) Tests in the Past 2 Years, 1967.

	Farm		Rural Nonfarm		Total Rural	
	Number	Percent	Number	Percent	Number	Percent
Chest X-ray or TB Test	2,092	28.8	1,973	31 8	4,065	30 2
No Chest X-ray or TB Test	5,171	71.2	4,232	68.2	9,403	69.8
Total	7,263	100.0	6,205	100.0	13,468	100.0

$X^2 = 14.181$, d.f. $= 1$, $P < 0.01$

Table 9 reveals this distribution. Differences in educational attainments of heads of households were significantly related to the level of participation in this health measure. The more formal education the heads of households had achieved, the greater the participation in this health practice.

To further examine this relationship, the data were delineated into farm and rural nonfarm groups (Table 10). The relationship still held for both the farm and rural nonfarm groups—the higher the formal educational attainments of the heads of households, the greater the participation of household members in dental checkups during the past 2 years.

This finding may be explained in part by income levels of the participants. Although income information was not secured from the respondents in this study, other studies have revealed that there is a high correlation between income and educational attainment (2). It seems plausible that heads of households with higher educational attainments would have more income for this and other health practices. This conclusion is substantiated in the report of the President's National Advisory Commission on Rural Poverty (7). The report stated: "The relationship between health care and income is even more striking for dental care. The poor rarely see a dentist. One-fourth of the poor have never seen a dentist. Only 24 percent of the persons in families with less than $3,000 income, compared with 57 percent of those in families with $7,000 or more income, visit a dentist during the year."

Table 11 depicts the number and percent of rural residents who had a dental checkup in the past 2 years by family size. Families were arbitrarily separated into those with four members or less and those with five members or more. Contrary to the hypothesized relationship, large families had a significantly higher incidence of dental checkups than smaller families.

The data were further categorized into farm and rural nonfarm groups. The findings are reported in Table 12. The differences based on family size and dental checkups were significant for both groups. Statistical tests were also executed between farm and rural nonfarm families with four members or less. There was no significant difference in dental checkups for this group. Similar tests were conducted for families of five or more members. Farm families exceeded rural nonfarm families in the percent of dental checkups at a significant level. This finding is also contrary to popular belief.

Chest X-rays or Tuberculin Tests

An increasing awareness of lung cancer and respiratory disorders has focused attention on the need for periodic chest examinations. There has also been

TABLE 10.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Dental Checkups in the Past 2 Years by Educational Attainments of the Heads of Households, 1967.

	Educational Attainment											
	0-11 Years				12 Years				More Than 12 Years			
	(1) Farm		(2) Nonfarm		(3) Farm		(4) Nonfarm		(5) Farm		(6) Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Dental Checkup	1,195	41.6	1,077	41.5	2,336	64.2	1,711	61.5	476	69.5	547	70.2
No Dental Checkup	1,678	58.4	1,519	58.5	1,305	35.8	1,071	38.5	209	30.5	232	29.8
Total	2,873	100.0	2,596	100.0	3,641	100.0	2,782	100.0	685	100.0	779	100.0

X^2 for columns 1, 3, and 5 = 389.945, d.f. = 2, $P < 0.01$
X^2 for columns 2, 4, and 6 = 60.162, d.f. = 2, $P < 0.01$

TABLE 14.—Number and Percent of Rural Ohio Males and Females Who Had Chest X-rays or Tuberculin (TB) Tests in the Past 2 Years, 1967.

	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
Chest X-ray or TB Test	2,052	29.6	2,013	30.8	4,065	30 2
No Chest X-ray or TB Test	4,870	70.4	4,533	69.2	9,403	69.8
Total	6,922	100.0	6,546	100.0	13,468	100.0

$X^2 = 1.956$, d.f. $= 1$, $P > 0.05$

TABLE 15.—Number and Percent of Ohio Rural Residents Who Had Chest X-rays or Tuberculin (TB) Tests in the Past 2 Years by Educational Attainments of the Heads of Households, 1967.

	Educational Attainment							
	0-11 Years		12 Years		More Than 12 Years		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Chest X-ray or TB Test	1,528	27.9	1,966	30.6	538	36.7	4,032	30.2
No Chest X-ray or TB Test	3,941	72.1	4,457	69.4	926	63.3	9,324	69.8
Total	5,469	100.0	6,423	100.0	1,464	100.0	13,356	100.0

$X^2 = 43.561$, d.f. $= 2$, $P < 0.01$

TABLE 17.—Number and Percent of Ohio Rural Residents Who Had Chest X-rays or Tuberculin (TB) Tests in the Past 2 Years by Family Size, 1967.

	Family Size					
	Four or Less Members		Five or More Members		Total	
	Number	Percent	Number	Percent	Number	Percent
Chest X-ray or TB Test	2,363	36.8	1,702	24.1	4,065	30.2
No Chest X-ray or TB Test	4,053	63.2	5,350	75.9	9,403	69.8
Total	6,416	100.0	7,052	100.0	13,468	100.0

$X^2 = 256.924$, d.f. $= 1$, $P < 0.01$

TABLE 18.—Number and Percent of Ohio Rural Residents Who Had Chest X-rays or Tuberculin (TB) Tests in the Past 2 Years by Family Size, 1967.

	Family Size							
	Four or Less Members				Five or More Members			
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Chest X-ray or TB Test	1,233	34.6	1,130	39.7	859	23.2	843	25.1
No Chest X-ray or TB Test	2,335	65.4	1,718	60.3	2,836	76 8	2,514	74.9
Total	3,568	100.0	2,848	100.0	3,695	100.0	3,357	100.0

X^2 for columns 1 and 3 $= 113.216$, d.f. $= 1$, $P < 0.01$
X^2 for columns 2 and 4 $= 150.729$, d.f. $= 1$, $P < 0.01$
X^2 for columns 1 and 2 $= 17.700$, d.f. $= 1$, $P < 0.01$
X^2 for columns 3 and 4 $= 3.430$, d.f. $= 1$, $P > 0.05$

an increasing accessibility to chest x-ray equipment through portable bus units and increasing amounts of hospital and clinical equipment. Many of these services are available free in most areas of the state.

The number and percent of rural people who had a chest x-ray or tuberculin (TB) test is shown in Table 13. A total of 30.2 percent of the respondents had an x-ray or a TB test in the past 2 years. The table also reveals that rural nonfarm residents have a significantly higher percent of x-rays or TB tests than farm residents. In the 1962 study of health practices among Ohio farm residents, 26 percent reported chest x-rays or TB tests in the past 2 years (1). This is compared to 28.8 percent in the 1967 study (Table 13).

In a comparison of males and females who had chest x-rays or TB tests, no significant difference was found (Table 14). This finding is inconsistent with the common notion that women are generally more health-conscious than men.

The heads of households were categorized into three groups based on their educational attainments: 0 to 11 years, 12 years, and more than 12 years of education. These groups were then viewed from the perspective of the percent who had chest x-rays or TB tests in the past 2 years (Table 15). There was a significant difference between educational attainments of the heads of households and the number of persons who had chest x-rays or TB tests. The higher the educational attainments of the heads of households, the higher the rate of chest x-rays or TB tests for the family members.

This distribution was further viewed by separating the respondents into farm and nonfarm groups (Table 16). Both groups continued to show a significant relationship between educational attainments of the heads of households and the number of chest x-rays or TB tests of the members. In addition, a higher percent of nonfarm residents participated in these tests than their farm counterparts.

It was hypothesized at the outset of this study that larger families would tend to participate less in recommended health practices than smaller families because of cost and inconvenience in acquiring these services. Although many of the services are free in most areas of the state, the inconvenience of getting all family members together for these services would be a factor.

Relative to chest x-ray and TB tests, these hypotheses appear to be supported (Table 17). The number and percent having chest x-rays and TB tests were related to family size, i.e., smaller families were more likely to acquire these health services than larger families. A further breakdown of the data by farm and rural nonfarm residents is shown in Table 18. Rural

TABLE 16.—Number and Percent of Ohio Rural Residents Who Had Chest X-rays or Tuberculin (TB) Tests in the Past 2 Years by Educational Attainments of the Heads of Households, 1967.

	0-11 Years				12 Years				More Than 12 Years			
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm		(5) Farm		(6) Rural Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Chest X-ray or TB Test	792	27.6	736	28.4	1,041	28.6	925	33.2	244	35.6	294	37.7
No Chest X-ray or TB Test	2,081	72.4	1,860	71.6	2,600	71.4	1,857	66.8	441	64.4	485	62.3
Total	2,873	100.0	2,596	100.0	3,641	100.0	2,762	100.0	685	100.0	779	100.0

X^2 for columns 1, 3, and 5 = 17.719, d.f. = 2, $P < 0.01$
X^2 for columns 2, 4, and 6 = 29.625, d.f. = 2, $P < 0.01$

TABLE 19.—Number and Percent of Ohio Rural Farm and Nonfarm Residents Who Had Tetanus Shots in the Past 3 Years, 1967.

	Farm		Rural Nonfarm		Total Rural	
	Number	Percent	Number	Percent	Number	Percent
Tetanus Shots	1,947	26.8	1,779	28.7	3,726	27.7
No Tetanus Shots	5,316	73.2	4,426	71.3	9,742	72.3
Total	7,263	100.0	6,205	100.0	13,468	100.0

$X^2 = 5.085$, d.f. $= 1$, $P < 0.05$

TABLE 20.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Tetanus Shots in the Past 3 Years by Family Size, 1967.

	Family Size							
	Four or Less Members				Five or More Members			
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Tetanus Shots	816	22.9	640	22.5	1,131	30.6	1,139	33.9
No Tetanus Shots	2,752	77.1	2,208	77.5	2,564	69.4	2,218	66.1
Total	3,568	100.0	2,848	100.0	3,695	100.0	3,357	100.0

X^2 for columns 1 plus 3 and 2 plus 4 $= 5.741$, d.f. $= 1$, $P < 0.02$
X^2 for columns 1 plus 2 and 3 plus 4 $= 151.364$, d.f. $= 1$, $P < 0.01$
X^2 for columns 1 and 3 $= 55.000$, 1 d.f., $P < 0.01$
X^2 for columns 2 and 4 $= 99.400$, 1 d.f., $P < 0.01$

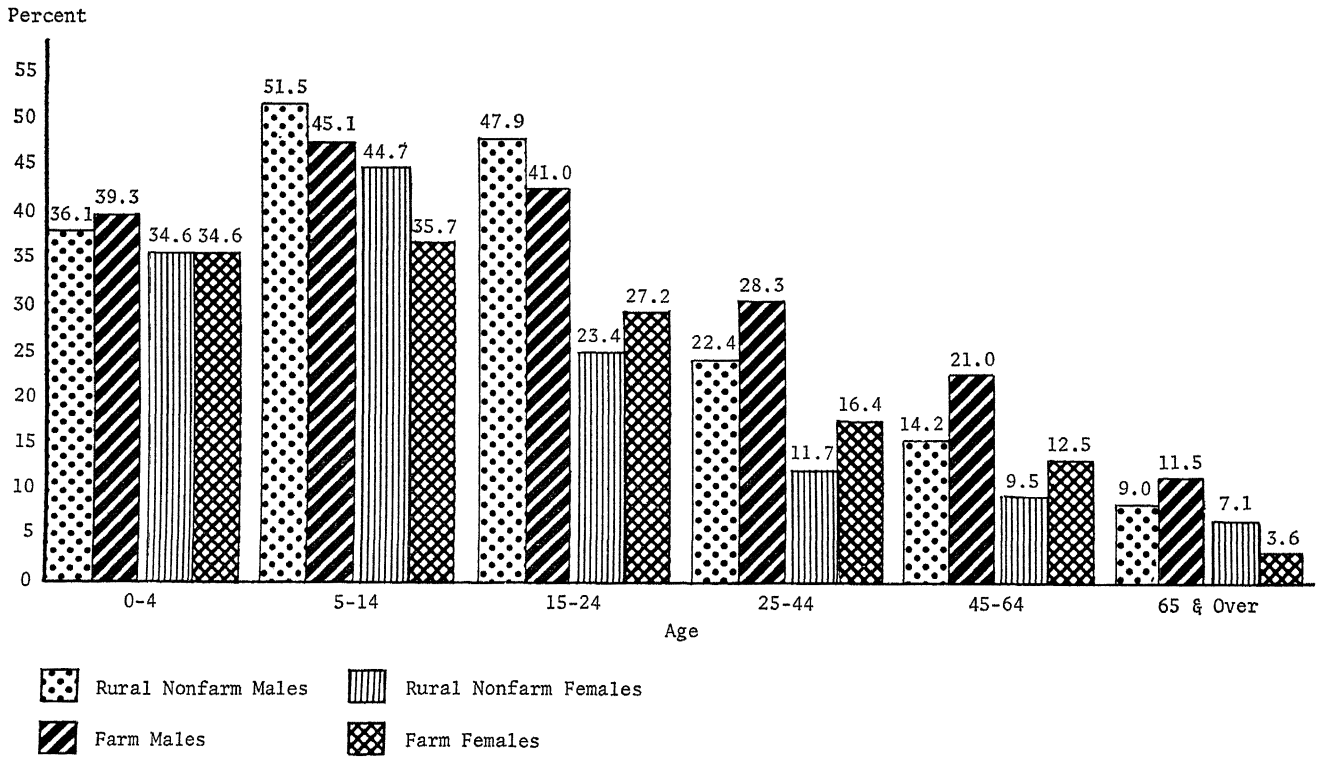

FIG. 2.—Percent of Ohio Farm and Rural Nonfarm Residents Who Had Tetanus Shots in Last 3 Years by Age and Sex, 1967.

nonfarm residents sought chest x-rays and TB tests at a significantly higher rate than their farm counterparts in the smaller size families. However, in the larger size families, the difference was not statistically significant. Within farm and rural nonfarm groups, the relationships between family size and participation in this health activity were still significantly different.

Tetanus Immunization

In Ohio, all school-age children must be protected from tetanus before enrolling in school. A planned program of booster shots is required throughout primary and secondary schools. However, adult immunization is voluntary. Thus, this section of the study is concerned with the characteristics of rural people who do or do not continue a regular tetanus immunization program.

Table 19 shows that 28 percent of Ohio's rural people had tetanus shots in the past 3 years. The difference between farm and rural nonfarm people was statistically significant. The farm population had 26.8 percent with tetanus shots while the rural nonfarm group had 28.7 percent.

To further analyze the characteristics of the population, they were broken down by age, sex, and place of residence (Figure 2). In all cases, the males exceeded the females having tetanus shots in the past 3 years.

As expected, the most protected group was the 5 to 14 age group. When considered by sex and place of residence, the protection declined after the 5 to 14 age group. There were no exceptions. For example, Figure 2 shows that the peak protection group was the 5 to 14 age group among the farm males (51.5 percent) and this declined by each category to 9.0 percent for those 65 years and over.

It is logical that under the school immunization law, school-age individuals would tend to be more protected. This is due to the regular immunization program carried out in most Ohio schools.

Immunization for adults is voluntary and, coupled with the difficulty of obtaining service for many rural residents, tends to result in a declining participation rate.

Another dimension of the characteristics of persons immunized against tetanus is the educational attainment of the head of the household. Figure 3 shows the relationship of educational attainment to immunization. There was no significant difference between farm and rural nonfarm heads of households with less than a high school education. Farm heads of households with a high school education or more had a significantly higher level of immunization.

Figure 3 also illustrates that as the educational attainment increases, the immunization level increases. This is true for both farm and rural nonfarm heads of households. However, farm heads of households have a significantly higher immunization rate than their rural nonfarm counterparts. Farm people have a higher incidence of occupation-related accidents than rural nonfarm people (9). This perhaps explains in part why farm heads of households exceed the rural nonfarm groups because people who are injured are usually given a tetanus booster shot.

Table 20 compares farm and rural nonfarm persons who had tetanus shots in the past 3 years by family size. There was no significant difference between farm and rural nonfarm families as to the number having tetanus shots by family size. However, families with four persons or less had significantly fewer incidences of tetanus immunization than families with more members. The differences were significant for both groups.

Measles Immunization

Measles are widely recognized as a childhood disease. However, measles are not limited to children. Serious side effects often accompany this disease, es-

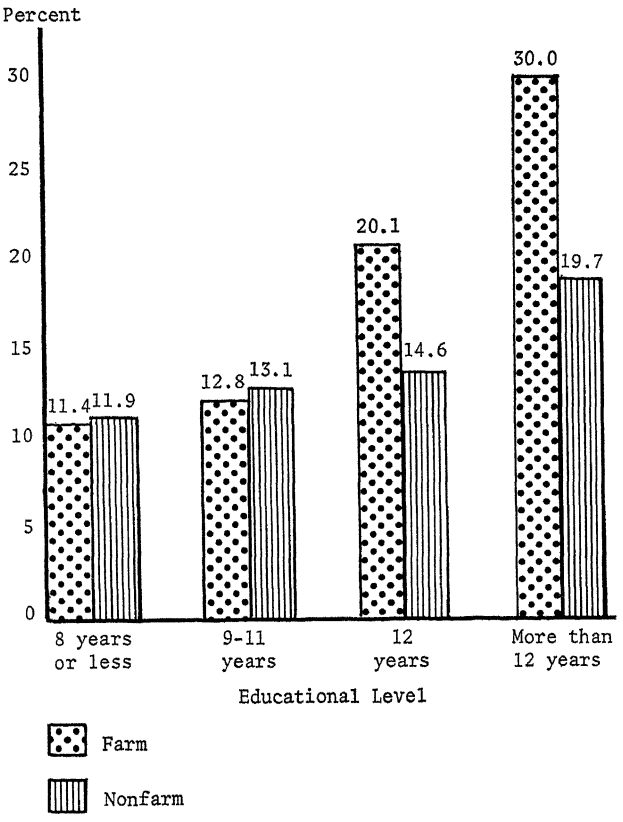

FIG. 3.—Percent of Ohio Farm and Rural Nonfarm Residents 25 Years of Age and More Who Had Tetanus Shots in Last 3 Years by Educational Attainments of Heads of Households, 1967.

TABLE 21.—Number and Percent of Ohio Farm and Rural Nonfarm Residents Who Had Measles Shots, 1967.

	Farm		Rural Nonfarm		Total Rural	
	Number	Percent	Number	Percent	Number	Percent
Measles Shots	827	11.4	875	14.1	1,702	12.6
No Measles Shots	6,436	88.6	5,330	85.9	11,766	87.4
Total	7,263	100.0	6,205	100.0	13,468	100.0

$X^2 = 22.42$, d.f. $= 1$, $P < 0.01$

pecially among adults. It has only been in this decade that a vaccine for preventive immunization has generally been made available. Thus, this study was concerned with determining to what extent Ohio's rural families availed themselves of this protection.

Table 21 shows the number and percent of farm and rural nonfarm people who had measles shots. It should be noted that 12.6 percent or approximately one out of every eight rural persons had measles shots. Of this number, 86.7 percent were 14 years of age or under. A further age breakdown of the 14 and under age group revealed that 38.4 percent of those who had been immunized were 4 years of age and under. This suggests that only a relatively few adults are immunized. Among the children, the younger (0 to 4 years of age) group tends to be better protected.

Table 22 compares the number of males and females who had measles shots. A significantly higher number of males had the shots than females. Although the magnitude of the difference was not great, the difference cannot be explained by this study.

Table 23 shows the distribution of youngsters 14 years of age and under by residence who had measles shots. This group was dichotomized into those 0 to 4 years of age and those 5 to 14. There were no significant differences between farm and rural nonfarm children in either age category.

The data in this section tended to show a low level of participation in this preventive health practice. Two reasons are offered for this. The first is that many people are naturally immune to measles from previously having had the disease. A second reason is that the vaccine was only recently introduced and has not become widely accepted.

SUMMARY

The data in this study were based on 2 years (1965 and 1966) with the exception of tetanus, which was for 3 years, and measles where no time limit was involved.

The first objective was to measure the level of participation in selected health practices by Ohio rural residents.

Ohio rural residents reported that:

- 38.0 percent had physical checkups in the past 2 years
- 54.8 percent had dental checkups
- 30.2 percent had x-rays or TB tests
- 27.7 percent had tetanus shots
- 12.6 percent had measles shots

Dental checkups had the highest level of participation of the five preventive health measures studied. However, only slightly more than one-half of the rural people in Ohio had dental checkups in the past 2 years. Many people, particularly the elderly, have lost their teeth and need only sporadic dental attention. However, it is obvious from these data that many people do not visualize dental checkups as a preventive health measure but usually visit dentists for the relief of existing problems.

Few rural people adhere to the medical advice of having a physical examination at least once a year.

TABLE 22.—Number and Percent of Ohio Farm and Rural Nonfarm Males and Females Who Had Measles Shots, 1967.

	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
Measles Shots	934	13.5	768	11.7	1,702	12.6
No Measles Shots	5,988	86.5	5,778	88.3	11,766	87.4
Total	6,922	100.0	6,546	100.0	13,468	100.0

$X^2 = 9.299$, d.f. $= 1$, $P < 0.01$

Many of the physical examinations reported could be accounted for by reasons other than as a preventive health measure initiated by the family. Many examinations are required by company policies, insurance, draft boards, athletic directors, camp directors, and school officials. If only those checkups which were planned by family members were reported, the total would be considerably lower than this study indicates.

Slightly more than one out of four rural people had tetanus shots (including boosters) within the past 3 years. This is in spite of the fact that immunization is inexpensive and generally effective against tetanus (lockjaw). According to an article in *Safer Farm Families,* nearly half of the victims of tetanus lose their lives (8). Obviously, the seriousness of this disease is not readily understood by most rural people.

The vaccine for measles is relatively new and would largely account for the small percentage of people who have availed themselves of this protection. Many adults would also have natural immunity from earlier exposure. It is anticipated that future generations will tend to take more advantage of this protection since children will benefit most from participation in this health measure. However, adults who have not had measles would also benefit from the immunization.

The second objective of the study was to compare the level of participation in selected health practices between farm and rural nonfarm residents. Differences reported by the two groups are summarized below:

Rural nonfarm people had a significantly higher percentage of physical checkups than farm residents within the past 2 years.

There was no significant difference between the proportion of farm and rural nonfarm people who had dental checkups within the past 2 years.

Rural nonfarm residents had a significantly higher percent of x-rays or tuberculin tests than farm people.

Rural nonfarm people had a significantly higher percent of tetanus shots than their farm counterparts.

Rural nonfarm residents had a significantly higher percent of measles immunizations than farm people.

Rural nonfarm families had a higher participation level than farm people in four out of five of the health practices studied. Dental checkups were an exception. Although the differences in participation levels between farm and rural nonfarm people were statistically significant, the magnitude of the spread was generally not exceptional.

TABLE 23.—Number and Percent of Ohio Farm and Rural Nonfarm Residents 14 Years of Age and Under Who Had Measles Shots, 1967.

	Age 4 or Less				Ages 5 to 14					
	(1) Farm		(2) Rural Nonfarm		(3) Farm		(4) Rural Nonfarm		Total Rural	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Measles Shots	217	48.2	276	45.5	372	16.3	418	24.7	1,283	29.0
No Measles Shots	233	51.8	331	54.5	1,297	77.7	1,273	75.3	3,134	71.0
Total	450	100.0	607	100.0	1,669	100.0	1,691	100.0	4,417	100.0

X^2 for columns 1 and 2 = 0.761, d.f. = 1, $P > 0.05$
X^2 for columns 3 and 4 = 2.647, d.f. = 1, $P > 0.05$

The third objective of the study was to examine participation levels in selected health practices by age, sex, educational attainment, and family size. The findings are summarized as follows:

Physical Checkups

Children 14 years of age and under had a significantly lower percent of physical checkups within the past 2 years than adults (15 and above).

Adults (15 and above) were not significantly different in the number of physical checkups by age groups.

Differences between the proportion of males and females who had physical checkups within the past 2 years were not significant.

The higher the educational attainments of the heads of households, the greater the number of physical checkups.

Families with four members or less had a significantly higher incidence of physical checkups than families of five or more members.

Dental Care

Females participated in dental checkups at a significantly higher rate than males.

The higher the formal educational attainments of the heads of households, the greater the participation of family members in dental checkups.

Larger families (five or more members) had a significantly higher incidence of dental checkups than smaller families (four or less).

Chest X-rays or Tuberculin Tests

There was no significant difference between males and females in the percent of chest x-rays or tuberculin tests.

The higher the educational attainments of heads of households, the higher the rate of chest x-rays or tuberculin tests for family members.

Small families (four or less members) were more likely to have acquired chest x-rays or tuberculin tests than members of larger families (five or more).

Tetanus Immunization

The proportion of males who had tetanus shots or boosters exceeded the proportion of females.

Tetanus protection of rural people declined with age among adults (15 and over).

As the educational attainments of the heads of households increased, the tetanus immunization level increased.

Larger families (five or more members) had significantly more tetanus immunizations than small families (four or less).

Measles Immunization

A significantly higher percent of males were immunized against measles than females.

Children (14 years of age and under) had a significantly higher level of immunization than adults.

A higher proportion of children from 0 to 4 years of age had measles immunization than those from 5 to 14.

CONCLUSIONS

The foregoing presentation of data and findings shows the levels of participation in preventive health practices among farm and rural nonfarm residents of Ohio. Five general conclusions are suggested based on these findings.

Conclusion 1: Rural nonfarm people generally participate more extensively in preventive health practices than farm residents.

This differential in participation is supported by data from the National Center for Health Statistics as reported in *The People Left Behind.* A portion of the differential is explained by the inaccessibility of health personnel and facilities in farm communities. It is stated in this manner:

"Although about 30 percent of our population still lives in rural areas, only 12 percent of our physicians, 18 percent of our nurses, 14 percent of our pharmacists, 8 percent of our pediatricians, and less than 4 percent of our psychiatrists are located in rural areas" (7).

Hassinger and McNamara argue that the differential cannot be explained by differences in beliefs about health practices but that the variation occurs between groups in the medical care delivery system (4). Mitchell and Finley have documented the inadequacy of health facilities and the number of medical personnel in some of Ohio's most rural counties (16). In general, their findings support the inaccessibility idea in rural Ohio.

It was beyond the scope of this study to determine whether there is a differential in belief patterns between Ohio's farm and rural nonfarm people. However, it is clear that there is a differential in the participation levels in preventive health practices.

Conclusion 2: No regular pattern of participation in preventive health practices can be attributed to the sex of the respondents.

Participation level by the sex of the respondents varied on particular preventive practices. However, no one direction was evidenced to the degree to suggest that differences could be attributed to sex alone.

Conclusion 3: The higher the educational attainments of the heads of households, the higher the level of participation in preventive health measures.

Hassinger and McNamara in their study conducted in Harrison County, Missouri, showed a lineal direction on the percentage of families reporting no family doctor and the education of the male head of households. Forty-three percent of the male heads with less than 8 years of education did not have a family doctor. Those with 8 to 11 years of education (34 percent) reported no family doctor and those with 12 or more years of education (23 percent) reported no family doctor (3). This finding, although not directly related to the conclusions drawn in this study, nevertheless seems to be of the same character. Generally speaking, educational attainment appears to be predictive of health behavior among farm and rural nonfarm people.

Conclusion 4: Family size was not a factor in determining the rate of participation in preventive health practices.

Differences existed in participation levels in various health practices in relationship to family size. However, no regular pattern of participation seemed to be related to this variable. Further study is needed to clarify and explain the variations which occurred. It is strongly suspected that the composition of a family and their income level would provide more insight on participation levels than family size alone.

Conclusion 5: Age was a factor in the level of participation in physical checkups and measles shots.

The four major reasons given in the 1960 Missouri study for not having regular physical examinations were neglect, cost, not necessary, and don't take time (5). Adults encounter more reasons to have physical examinations as they get older. Such things as pregnacies, injuries, and so forth require the individual to give more attention to this health measure. The low participation (38 percent) strongly suggests that few rural people have physical examinations on a planned basis. They tend largely to respond to need. Children generally have less need than their parents.

Measles has traditionally been viewed as a childhood disease. As such, children would expect to have a greater participation in this health measure.

IMPLICATIONS

The tentative conclusions and the more specific findings reported suggest that health programs with aims of getting people in rural areas to participate widely in preventive health practices have a considerable way to go before approaching their ultimate goal.

If the thesis of Hassinger and McNamara is correct that the differences in participation are not in beliefs about health practices but in the inaccessibility of medical personnel and facilities (4), then it would appear that health officials can increase the level of participation in two ways. First, they can improve the accessibility of medical personnel and health facilities in rural areas. Second, they can increase the intensity of educational programs to cause rural people to put a higher priority on preventive health practices so they will be more willing to go the extra distance to acquire a full range of health services. This may at least partially offset the problem of inaccessibility.

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